AF/NFW

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
PATENT APPLICATION EXAMINING OPERATIONS

Appl. No.	: 10/645,226	Confirmation No. 7137
Applicant	: Steve Lin	
Filed	: August 21, 2003	
TC/A.U.	: 3727	
Examiner	: Smalley, James N.	
Docket No.	: DES: 1250.0030	
Customer No.	: 00152	

APPELLANT'S BRIEF

1600 ODS Tower
601 S.W. Second Avenue
Portland, OR 97204
Tel. 503.227.5631

August 15, 2005

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Real Party In Interest

The real party in interest is PML Microbiologicals, Inc., an Oregon corporation.

Related Appeals and Interferences

There are no related appeals or interferences.

Status of Claims

Claims 1-6 and 8 stand rejected and are appealed; claim 7 has been cancelled. A copy of the appealed claims is set forth in the Claims Appendix.

Status of Amendments

No amendment has been filed subsequent to the Final Rejection dated May 17, 2005.

Summary of Claimed Subject Matter

The invention claimed in independent claim 1 (from which claims 2-6 and 8 depend) comprises a fluid-tight vial (page 2, lines 18-21 and element 1 in FIGS. 1 and 3) comprising a substantially cylindrical container (page 3, lines 35-37 and element 10 in FIGS. 1 and 3) with an open end having a circumferential flange integral with the lip of the container (page 3, line 37 and see FIG. 3 in the vicinity of element 12), with a screw thread (page 3, line 37 and element 14 in FIG. 3) and a ratchet-toothed ring (page 4, line 1 and element 16 in FIG. 3), both proximal to the open end of the container (page 4, lines 1-3 and see FIGS. 1 and 3). The vial includes a cap (element 2 in FIG. 1) adapted to engage the container's open end in fluid-tight fashion (page 3, lines 34-35), the cap comprising a circumferential skirt (page 4, line 8 and element 22 in FIG. 2), a flexible hinge (page 4, lines 12-13 and element 32 in FIG. 5), a frangible strip (page 4, line 9 and element 27 in FIGS. 5, 7 and 10) and a flip top (page 4, line 12 and element 30 in FIGS. 5 and 7-8), wherein the inner portion of the cap's skirt 22 has a screw thread (page 4, line19 and element 24 in FIG. 8) capable of matingly engaging screw threads 14 of the

open end of the container (page 4, lines 19-20) and a ratchet-toothed ring (page 4, line 21 and element 26 in FIG. 9) capable of lockingly engaging the ratchet-toothed ring 16 of the open end of the container when the cap is threaded onto the container (page 4, lines 21-23 and 29-31). Flip top 32 is provided with an inner circumferential recess (page 4, lines 12-13 and element 36 in FIGS. 6-8) capable of non-threadedly engaging the circumferential flange of the open end of the container so as to form a fluid-tight seal between recess 36 and the circumferential flange along the top lip (page 4, lines 13-14 and 36-37 through page 5, line 1).

As to claim 8, the inner circumferential recess 36 has a radial tongue portion (page 4, lines 15-16 and element 38 in FIGS. 6 -7 and 9) proximal to hinge 32 (FIGS. 7 and 9) and capable of guiding circumferential recess 36 into alignment with the circumferential flange (page 4, lines 15-18).

Grounds of Rejection to be Reviewed on Appeal

The only issue presented for review is the propriety of the obviousness rejection of claims 1-6 and 8 as being unpatentable over Davis et al. U.S. Patent No. 3,991,904 (the '904 patent) in view of Ostrowsky U.S. Patent No. 4,487,324 (the '324 patent) and in view of Ferris U.S. Patent No. 5,101,870 (the '870 patent).

ARGUMENT

Prior Art Relied Upon

The '904 Patent The '904 patent discloses a plastic container and closure assembly wherein the closure comprises a cap part 22, a tear-off or frangible strip 23 and an

anchor band 24 which, when the frangible strip has been removed, is connected to the cap part by a hinge 25. The inside of cap part 22 has an annular bung 30 provided with a deep end 31 and a shallow end 32. The cap is secured to the container by an annular internal projection 37 on the skirt of the cap snapping over an annular outwardly projecting bead 3 on the container, as shown in FIG. 3. The Examiner points to that portion of FIG. 3 of the '904 patent shown in phantom above sealing ring 36 as showing a circumferential rim flange which, for purposes of argument, is conceded. Apparently, the Examiner contends that sealing ring 36 also comprises a second type of flange, namely, "an inner circumferential flange." Final Rejection, page 2, section 3, last sentence in second paragraph. But the '904 patent does not disclose an inner circumferential recess of cap part 22 that is capable of non-threadedly engaging the circumferential flange so as to form a fluid-tight seal between the flange and the recess, and the Examiner in fact points to nothing in '904 supplying this deficiency. Nor does the '904 patent disclose two ratchet-toothed rings, one on each of the container and the cap, that are capable of lockably engaging with each other; again, the Examiner points to nothing in '904 concerning this deficiency in its disclosure. Finally, the Examiner concedes that the '904 patent does not teach a threaded engagement between the cap and the container.

Significantly, the entire thrust of the '904 patent is that the leakage problem occurring with the prior art captive cap closure device of U.S. Patent No. 3,441,161 was overcome by doing away entirely with a shallow annular bung and a prong-like tongue or projection and replacing the same with a deeper annular bung shaped with the sloping profile seen in FIG. 2 of the '904 patent. See Column 1, lines 15-21 and Column 2, lines 6-10 and 22-

26 and compare FIG. 1 of U.S. Patent No. 3,441,161, attached for convenience of reference in the Evidence Appendix.

The '324 Patent The '324 patent discloses a tamper-evident dispensing closure device wherein the skirt 20 of the cap is provided with threads 28 adapted to be threadedly engaged with the threaded neck of container C. Ratchet teeth 29 are also provided on the inside of skirt 20 and are designed to cooperate with lugs 31 on the neck of the container C, so that once the closure device is secured the interlocking teeth make it impossible to unscrew the closure from the container. Column 2, lines 56-62. The '324 patent also discloses a snap-on connection of the cap to the container in FIG. 7. The Examiner contends that the '324 patent teaches the mechanical equivalence between (*i*) a snap-on connection such as shown in FIG. 7 of the '904 patent and (*ii*) the combination of a screw-on closure and two lockably engageable ratchet-toothed rings; appellant disagrees with this contention for the reasons set forth below under the section discussing obviousness.

The '870 Patent The '870 patent discloses a combination conforming funnel 14 and disposable fluid container 12 for containing and easily pouring fluids such as motor vehicle engine oil. Each of the embodiments shown in FIGS. 2 and 5-7 show containers having an integrally formed tubular neck 34 having a considerably reduced diameter relative to the container portion 20.

Obviousness of Claims 1-6

Claim 1 is the only independent claim in the application, with all of claims 2-6 ultimately depending therefrom. Thus, if claim 1 is not rendered obvious by the combination of references applied by the Examiner, neither are claims 2-6.

There are three limitations in claim 1 that appellant contends are not disclosed or suggested by the prior art relied upon for the final rejection: (1) a substantially cylindrical container; (2) the combination of screw threads in the cap and on the container and two ratchet-tooth rings in the cap and on the container; and (3) an inner circumferential recess in the flip-top portion of the cap that is capable of non-threadedly engaging a circumferential flange that is integral with the circumferential lip of the container so as to form a fluid-tight seal between the flange and the recess. Thus, if the combination of prior art references applied by the Examiner fails to disclose or suggest any one of these three limitations, the obviousness rejection must fail.

As to limitation (1) above, the Examiner relies upon FIG. 5 of the '870 patent. However, the Examiner is respectfully submitted to have construed the teachings of '870 too broadly. FIG. 5 of '870 does not disclose a cylindrical container, but rather a partially cylindrical container having an integrally formed tubular neck 22a with a considerably reduced diameter relative to the container portion 20a. Indeed, the entire thrust of '870 is the provision of a funnel for "easy pour" motor oil containers that are universally provided with integrally formed upright tubular necks that will fit into the oil filler tube of an automobile engine. Referring for example to FIG. 5 of '870, the spout 34a is molded to "closely conform" to the container neck 22a. Column 4, lines 5-10. *A fortiori* for the inverted funnel to closely fit over the container, the neck of the container must be of a substantially reduced diameter relative to that of the rest of the

container. A fair reading of the claim 1 limitation "a substantially cylindrical container" is submitted to be "substantially in the shape of a cylinder." The Board may take official notice of the definition of a "cylinder" from any dictionary. See, for example, the attached excerpt from *Webster's II New College Dictionary* in the Evidence Appendix. This is not what is shown in FIG. 5 of the '870 patent.

As to limitation (2) above, the Examiner asserts that the '324 patent teaches that a snap-on connection such as shown in the '904 patent is mechanically equivalent to the combination of a pair of cooperating screw threads and two ratchet-toothed rings.

Initially it is noted that the '324 patent does not even disclose two ratchet-toothed rings, but rather one ratchet-toothed ring in the cap portion that cooperates with lugs 31 on the neck of the container. See the '324 patent at column 2, lines 56-59.

As to supposed equivalents, '324 takes pains to distinguish the snap connection from a screw-on disclosure, stating of the snap-on connection, "This manner of securing the closure to a package facilitates close radial control over the radial orientation of the closure and orifice, more so than screw-on closures permit." Column 6, lines 34-37. Note that this statement makes no mention of ratchet-toothed rings. Note also that there is no statement in the '324 patent to the effect that the snap connection may be substituted for the combination of a threaded connection and two ratchet-toothed rings. All '342 teaches regarding the combination of ratchet teeth 29/lugs 31 is that they are "suitable means" for adapting closure 10 "to be fixedly secured to the container so that it may not readily be removed therefrom." Column 2, lines 54-60.

Finally, appellant respectfully points out that the disclosure of the '324 patent should be taken as a whole. In doing so, it is seen that the snap-on connection shown in FIG. 7

of '324 (discussed in Column 6 at lines 19-37), also discloses as part of that connection a stud 144 which includes a retaining barb 145. See Column 5, lines 56-58. This barbed stud also amounts to a snap-on connection of the cap to the bottle. This "two-part" snap-on connection of '324 is not the same as the "one-part" snap-on connection of '904 and further weakens the supposed teaching of mechanical equivalence.

As to limitation (3) above concerning an inner circumferential recess in the flip-top that is capable of non-threadedly engaging the circumferential flange of the lip of the container to form a fluid-tight seal between the flange and the recess, the primary '904 reference does not disclose such a feature. Specifically, the Examiner points to the phantom portion of FIG. 3 of '904 as showing a circumferential flange of the container around the mouth or upper edge of the container. But it is apparent from FIG. 3 and the accompanying text pertaining thereto, that the circumferential recess in the cap is not capable of forming a fluid-tight seal between the flange and the recess. That this is so is supported by the discussion of FIG. 3 at Column 3, lines 23-35, and in particular the following: "Reference to FIG. 3 will show that the mouth or upper edge of the container really plays no part in the sealing effected by the closure."

Obviousness of Claim 8

Claim 8 is dependent from claim 1 and adds the limitation that the inner circumferential recess of the cap's flip-top has a radial tongue portion proximal to the hinge that is capable of guiding the inner circumferential recess into alignment with the circumferential flange of the container. Claim 8 stands rejected under 35 USC 103(a) as being unpatentable over

'904 in view of '324 and in view of '870. In response, appellant offers two arguments why this rejection is not well-founded.

First, for the reasons stated above in connection with the discussion of claims 1-6, claim 1 is not obvious in view of the combination of the three references noted. Because claim 8 depends from claim 1 and so contains the same limitations as does claim 1, claim 8 is likewise not obvious in view of the cited references.

Second, a careful reading of '904 reveals that the Examiner's reliance upon '904 as supposedly teaching the aforementioned limitation of claim 8 is not supported.

Specifically, '904 does not teach a radial tongue, but rather an annular bung 30. See FIG. 2 and Column 2, lines 61-66. The Board may take official notice from any dictionary that "annular" means "shaped like or forming a ring." See, for example, the excerpt from *Webster's II New College Dictionary* in the Evidence Appendix. Appellant's radial tongue portion 38 is not shaped like a ring. See appellant's FIGS. 6 and 9. Without more, '904 does not teach or suggest the "radial tongue portion" limitation of claim 8.

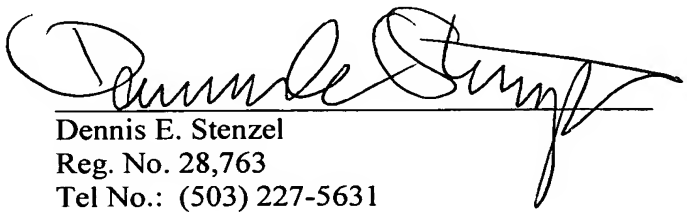
And, as pointed out previously, the entire thrust of the '904 patent is that the leakage problem occurring with the prior art captive cap closure device of U.S. Patent No. 3,441,161 was overcome by doing away entirely with a shallow annular bung and a prong-like tongue or projection and replacing the same with a deeper annular bung shaped with the sloping profile seen in FIG. 2 of the '904 patent. See Column 1, lines 15-21 and Column 2, lines 6-10 and 22-26 of the '904 patent and compare FIG. 1 of U.S. Patent No. 3,441,161 in the Evidence Appendix.

Finally, the only way that one skilled in the art could achieve appellant's radial tongue portion from the annular bung of the '904 patent would be to remove all of the annular bung except for a small radial portion thereof. But this would destroy the very improvement in design (the removal of the prong-like projection and the deepened and reshaped annular bung) that is the subject of the '904 patent, which presumably would lead to the leakage problem of the prior art design. It is well-settled that if a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon,* 221 USPQ 1125 (Fed Cir 1984). Here, the deepened and reshaped annular bung of the '904 invention is to remedy the leakage problems of the prior art device. But the modification of the '904 annular bung to achieve a radial tongue portion apparently proposed by the Examiner would eliminate the advantages achieved by '904's deepened and reshaped annular bung, thereby rendering it unsatisfactory for its intended purpose.

Conclusion

For the reasons stated, the final rejection of claims 1-6 and 8 should be reversed and those claims should all be allowed.

Respectfully submitted,



Dennis E. Stenzel
Reg. No. 28,763
Tel No.: (503) 227-5631

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Dated: August 15, 2005

Dennis E. Stenzel

CLAIMS APPENDIX

1. A fluid-tight vial comprising:

(a) a substantially cylindrical container with an open end having a circumferential lip, a circumferential flange integral with said circumferential lip, a screw thread and a ratchet-toothed ring proximal to said open end; and

(b) a cap adapted to engage said container's open end in fluid-tight fashion, said cap comprising a circumferential skirt, a hinge, a frangible strip and a flip-top, wherein the inner portion of said skirt has a screw thread capable of matingly engaging said screw thread of said open end of said container and a ratchet-toothed ring capable of lockingly engaging said ratchet-toothed ring of said open end of said container when said cap is threaded onto said container

wherein said flip-top has an inner circumferential recess capable of non-threadedly engaging said circumferential flange to form a fluid-tight seal between said flange and said recess.

2. The vial of claim 1 wherein said screw thread of said container is located below said circumferential lip and said ratchet-toothed ring of said container is located beneath said screw thread of said container.

3. The vial of claim 2 wherein said ratchet-toothed ring of said cap is located beneath said screw thread of said cap.

4. The vial of claim 1 wherein said frangible strip is located between said skirt and said flip-top.

5. The vial of claim 4 wherein said frangible strip has a pull tab for peeling it away from said cap.

CLAIMS APPENDIX (Cont'd)

6. The vial of claim 5 wherein said flip-top is attached to said skirt by said hinge and is openable after said frangible strip is removed.

8. The vial of claim 1 wherein said inner circumferential recess of said flip-top has a radial tongue portion proximal to said hinge capable of guiding said inner circumferential recess into alignment with said circumferential flange of said container.

EVIDENCE APPENDIX

Webster's II

New College Dictionary

(1995)

Houghton Mifflin Company
Boston • New York

cy·clase (sī′klās′, -klāz′) *n.* An enzyme that acts as a catalyst in the cyclization of a compound.

cy·cle (sī′kəl) *n.* [Fr. < LLat. *cyclus* < Gk. *kuklos*, circle.] **1.** A time interval in which a characteristic, esp. a regularly repeated event or sequence of events occurs: **2. a.** A single complete execution of a periodically repeated phenomenon. **b.** A periodically repeated sequence of events. **3.** The orbit of a celestial body. **4.** A long period of time : AGE. **5. a.** The aggregate of traditional poems or stories organized around a central theme or hero <the Arthurian *cycle*> **b.** A series of poems or songs on the same theme <Mahler's song *cycles*> **6.** A motorcycle or bicycle. **7.** *Bot.* A circular arrangement of flower parts, as petals or sepals. —*v.* **-cled, -cling, -cles.** —*vi.* **1.** To occur in or pass through a cycle. **2.** To move in or as if in a circle. **3.** To ride a bicycle or motorcycle. —*vt.* To use or employ in a cycle. **—cy′cler** *n.*

cy·clic (sī′klĭk, sĭk′lĭk) *also* **cy·cli·cal** (sī′klĭ-kəl, sĭk′lĭ-kəl) *adj.* **1. a.** Of, pertaining to, or marked by cycles. **b.** Moving or recurring in cycles. **2.** *Chem.* Of or relating to compounds with atoms arranged in a ring or closed-chain structure. **3.** *Bot.* **a.** Having parts arranged in a whorl. **b.** Forming a whorl. **—cy′cli·cal·ly** *adv.*

cyclic AMP *n.* A cyclic nucleotide that acts as a hormonal mediator on the cellular level in the control of various metabolic processes.

cyclic GMP *n.* A cyclic nucleotide of guanosine believed to act as an antagonist to cyclic AMP in cellular processes.

cy·clist (sī′klĭst) *n.* One who rides or races a two-wheeled vehicle, as a bicycle or motorcycle.

cy·cli·za·tion (sī′klĭ-zā′shən, sĭk′lĭ-) *n.* Formation of rings in a hydrocarbon.

cyclo- *or* **cycl-** *pref.* [< Gk. *kuklos*, circle.] **1.** Circle : cycle. <*cyclorama*> **2.** A cyclic compound <*cyclohexane*>.

cy·clo·al·kane (sī′klō-ăl′kān) *n.* An alicyclic hydrocarbon with a saturated ring.

cy·clo·hex·ane (sī′klō-hĕk′sān′) *n.* A highly flammable, colorless, mobile liquid, C_6H_{12}, obtained from petroleum and benzene and used in making nylon and as a solvent, paint and varnish remover.

cy·clo·hex·i·mide (sī′klō-hĕk′sə-mīd′, -mĭd) *n.* A compound, $C_{15}H_{23}NO_4$, used as an agricultural fungicide.

cy·cloid (sī′kloid′) *adj.* [Fr. *cycloïde* < Gk. *kukloeidēs*, circular : *kuklos*, circle + *-eidēs*, -oid.] **1.** Resembling a circle. **2.** *Zool.* Thin, rounded, and smooth-edged. —Used of fish scales. **3.** *Psychiat.* Designating a person afflicted with cyclothymia. —*n. Math.* The curve traced by a point on the circumference of a circle rolling on a straight line. **—cy·cloi′dal** (-kloid′l) *adj.*

cy·clom·e·ter (sī-klŏm′ĭ-tər) *n.* **1.** An instrument for recording the revolutions of a wheel so as to indicate distance traveled. **2.** An instrument for measuring circular arcs. **—cy′clo·met′ric** (-klə-mĕt′rĭk) *adj.* **—cy·clom′e·try** *n.*

cy·clone (sī′klōn′) *n.* [Poss. < Gk. *kuklōma*, coil < *kuklos*, circle.] **1.** *Meteorol.* An atmospheric disturbance marked by masses of air rapidly circulating clockwise in the southern and counterclockwise in the northern hemisphere about a low-pressure center, usu. accompanied by stormy, often destructive weather. **2.** A violent, rotating windstorm. **3.** A device using centrifugal force to separate materials. **—cy·clon′ic** (-klŏn′ĭk), **cy·clon′i·cal** *adj.*

cyclone cellar *n.* An underground shelter in or adjacent to a house, used for protection from cyclones or tornadoes.

cy·clo·pae·di·a (sī′klə-pē′dē-ə) *n. var. of* CYCLOPEDIA.

cy·clo·par·af·fin (sī′klō-păr′ə-fĭn) *n.* Cycloalkane.

cy·clo·pe·an (sī′klə-pē′ən, sī-klō′pē-) *adj.* **1.** *often* **Cyclopean.** Relating to or like the Cyclopes. **2.** Relating to or designating a primitive masonry style using massive, irregularly shaped stones.

cy·clo·pe·di·a *also* **cy·clo·pae·di·a** (sī′klə-pē′dē-ə) *n.* [Short for ENCYCLOPEDIA.] An encyclopedia. **—cy′clo·pe′dic** (-dĭk) *adj.* **—cy′clo·pe′dist** (-dĭst) *n.*

cy·clo·pen·tane (sī′klə-pĕn′tān′, sĭk′lə-) *n.* A colorless flammable liquid, C_5H_{10}, derived from petroleum and used as a solvent and motor fuel.

Cy·clo·pes (sī-klō′pēz) *n. pl. of* CYCLOPS.

cy·clo·ple·gia (sī′klə-plē′jə) *n.* Loss of visual accommodation due to paralysis of the ciliary muscles of the eye.

cy·clo·pro·pane (sī′klə-prō′pān′) *n.* A highly flammable, explosive, colorless gas, C_3H_6, used as an anesthetic.

Cy·clops (sī′klŏps′) *n., pl.* **Cy·clo·pes** (sī-klō′pēz) [Lat. < Gk. *kuklōps* : *kuklos*, circle + *ōps*, eye.] *Gk. Myth.* **1.** Any of the three one-eyed Titans who forged thunderbolts for Zeus. **2.** Any of a race of one-eyed giants, reputedly descended from these Titans, living on the island of Sicily.

cy·clo·ram·a (sī′klə-răm′ə, -rä′mə) *n.* [CYCL(O)- + (PAN)ORAMA.] **1.** A large composite picture placed on the interior walls of a cylindrical room so as to appear in natural perspective to a spectator standing in the center. **2.** A large usu. concave curtain or wall placed or hung at the rear of a stage. **—cy′clo·ram′ic** *adj.*

cy·clo·ser·ine (sī′klō-sĕr′ēn′) *n.* An antibiotic produced by a species of *Streptomyces*, and used in the treatment of tuberculosis and urinary tract infections.

cy·clo·sis (sī-klō′sĭs) *n., pl.* **-ses** (-sēz) [NLat. < Gk. *kuklōsis*, a surrounding < *kukloun*, to surround < *kuklos*, circle.] The streaming circulatory motion of protoplasm within a cell.

cy·clo·spor·ine (sī′klə-spôr′ēn, -ĭn, -spôr′-) *also* **cy·clo·spor·in** (-ĭn) *n.* An immunosuppressive drug obtained from certain soil fungi, used mainly to prevent the rejection of transplanted organs.

cy·clo·stome (sī′klə-stōm′) *n.* [NLat. *Cyclostomi*, and *-stomata*, class names : CYCLO- + Gk. *stoma*, mouth.] A primitive jawless vertebrate of the class Agnatha, as a lamprey, lacking jaws and teeth and having a circular, sucking mouth. **—cy·clos′to·mate** (sī-klŏs′tə-māt′), **cy′clo·stom′a·tous** (sī′klə-stŏm′ə-təs, -stō′mə-) *adj.*

cy·clo·thyme (sī′klə-thīm′) *n.* One with a cyclothymic personality.

cy·clo·thy·mi·a (sī′klə-thī′mē-ə) *n.* An affective disorder characterized by alternating periods of elation and depression. **—cy′clo·thy′mic** (-mĭk) *adj. & n.*

cy·clo·tron (sī′klə-trŏn′) *n.* A circular accelerator capable of generating particle energies between a few million and several tens of billions of electron volts, in which charged particles generated at a central source are accelerated spirally outward in a plane at right angles to a fixed magnetic field by an alternating electric field.

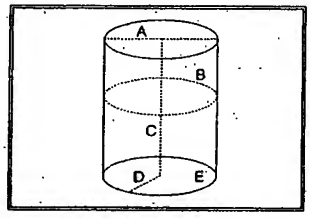
cy·der (sī′dər) *n. Chiefly Brit. var. of* CIDER.

cy·e·sis (sī-ē′sĭs) *n., pl.* **-ses** (-sēz′) [NLat. < Gk. *kuēsis* < *kuein*, to swell.] Gestation : pregnancy.

cyg·net (sĭg′nĭt) *n.* [ME *sygnett* < OFr. *cygne*, swan < Lat. *cygnus*, Gk. *kuknos*.] A young swan.

Cyg·nus (sĭg′nəs) *n.* [Lat. *cygnus*, swan < Gk. *kuknos*.] A constellation in the Northern Hemisphere.

cyl·in·der (sĭl′ən-dər) *n.* [OFr. *cylindre* < Lat. *cylindrus* < Gk. *kulindros* < *kulindein*, to roll.] **1.** *Math.* **a.** A surface generated by a straight line moving parallel to a fixed straight line and intersecting a plane curve. **b.** The part of such a surface bounded by two parallel planes and the regions of the planes bounded by the surface. **c.** A solid bounded by two parallel planes and such a surface having a closed curve, esp. a circle, as a directrix. **2.** A cylindrical container or object. **3.** *Engineer.* **a.** The chamber in which a piston of a reciprocating engine moves. **b.** The chamber of a pump from which fluid is expelled by a piston. **4.** The rotating chamber of a revolver that holds the cartridges. **5.** Any of the rotating cylinders in a printing press that carry the paper or the curved printing plate or receive the ink or impression. **6.** A cylindrical clay or stone object with an engraved design or cuneiform inscription.



cylinder
A. diameter,
B. circumference,
C. altitude,
D. radius,
E. base

cylinder head *n.* The closed, often detachable end of a cylinder or cylinders in an internal-combustion engine.

cy·lin·dri·cal (sə-lĭn′drĭ-kəl) *also* **cy·lin·dric** (-drĭk) *adj.* **1.** Having the shape or properties of a cylinder. **2.** Of or relating to a cylinder. **3.** Of or relating to the coordinate system or to any of three coordinates in it, formed by two polar coordinates in a plane and a rectangular coordinate measured perpendicularly from the plane. **—cy·lin′dri·cal′i·ty** (-kăl′ĭ-tē) *n.* **—cy·lin′dri·cal·ly** *adv.*

cyl·in·droid (sĭl′ən-droid′) *n.* A cylindrical surface or solid all of whose sections perpendicular to the elements are elliptical. —*adj.* Resembling a cylinder.

cy·ma (sī′mə) *n.* [Gk. *kuma* < *kuein*, to swell.] A molding for a cornice, with a partly concave and partly convex curve in profile, used esp. in classical architecture.

cy·ma·tium (sī-mā′shəm, -shē-əm) *n., pl.* **-tia** (-shə, -shē-ə) [Lat. < Gk, *kumation*, dim. of *kuma*, cyma.] **1.** A cyma. **2.** The topmost molding of a classical cornice.

cym·bal (sĭm′bəl) *n.* [ME < OFr. *cymbale* < Lat. *cymbalum* < Gk. *kumbalon* < *kumbē*, bowl.] **1.** One of a pair of concave brass plates struck together as percussion instruments. **2.** A single brass plate, sounded by hitting with a drumstick and often part of a set of drums. **—cym′bal·eer′** (sĭm′bə-lîr′), **cym′bal·er, cym′bal·ist** *n.*

cym·bid·i·um (sĭm-bĭd′ē-əm) *n.* [NLat. *Cymbidium*, genus name < Lat. *cymba*, boat < Gk. *kumbē*.] An orchid of the genus *Cymbidium*, with showy flowers often used for decoration.

cyme (sīm) *n.* [NLat. *cyma* < Lat., young cabbage sprout < Gk. *kuma*, cyma, sprout.] *Bot.* An often flat-topped flower cluster blooming from the center toward the edges, whose main axis is always terminated by a flower. **—cy·mif′er·ous** (sī-mĭf′ər-əs) *adj.*

cy·mene (sī′mēn′) *n.* [Fr. *cymène* < Gk. *kuminon*, cumin, of Se-

state or country. 3. To add or attach, as an attribute, condition, or consequence. —*n.* (ăn′ĕks′, -ĭks). 1. a. A structure added on to a larger one. b. An auxiliary structure situated near a main one. 2. An addition to a record or document. —**an′nex·a′tion** (ăn′ĭk-sā′shən) *n.* —**an′nex·a′tion·al** *adj.* —**an′nex·a′tion·ism** *n.* —**an′nex·a′tion·ist** *n.*

an·nexe (ăn′ĕks′) *n. Chiefly Brit. var. of* ANNEX.

An·nie Oak·ley (ăn′ē ōk′lē) n. [After *Annie Oakley* (1860–1926).] *Slang.* A complimentary admission ticket.

▲ ***word history:*** Annie Oakley was a sharpshooter with Buffalo Bill's show, *The Wild West*, who sometimes used playing cards as targets. Free passes that were punched to prevent their being sold were thought to resemble Annie Oakley's handiwork.

an·ni·hi·late (ə-nī′ə-lāt′) *v.* **-lat·ed, -lat·ing, -lates.** [LLat. *annihilare, annihilat-* : Lat. *ad-*, to + Lat. *nihil*, nothing.] —*vt.* 1. To destroy all traces of : OBLITERATE. 2. To nullify or render void : ABOLISH. 3. *Informal.* To overwhelm or vanquish completely. —*vi. Physics.* To participate in annihilation, as do an electron and a positron. —**an·ni′hi·la·bil′i·ty** (-lə-bĭl′ĭ-tē) *n.* —**an·ni′hi·la·ble** (-lə-bəl) *adj.* —**an·ni′hi·la′tor** *n.*

an·ni·hi·la·tion (ə-nī′ə-lā′shən) *n.* 1. The act or process of annihilating. 2. A condition of utter destruction. 3. *Physics.* The phenomenon in which a particle and an antiparticle, as an electron and a positron, disappear with a resultant release of energy approx. equivalent to the sum of their masses.

an·ni·ver·sa·ry (ăn′ə-vûr′sə-rē) *n., pl.* **-ries.** [ME *anniversarie* < Med. Lat. *anniversarium* < Lat. *anniversarius*, returning yearly : *annus*, year + *versus*, p.part. of *vertere*, to turn.] 1. The annual recurrence of the date of an earlier event. 2. A commemorative celebration on the date of an anniversary.

an·no Dom·i·ni (ăn′ō dŏm′ə-nī′, dōm′ə-nē) *adv.* [Lat., in the year of the Lord.] In a specified year of the Christian era. —Used chiefly in the abbreviated form <A.D. 495>

an·no·tate (ăn′ō-tāt′) *v.* **-tat·ed, -tat·ing, -tates.** [Lat. *annotare, annotat-*, to note down : *ad-*, to + *notare*, to write < *nota*, note.] —*vt.* To furnish (a literary work) with critical commentary or explanatory notes : GLOSS. —*vi.* To gloss a text.

an·no·ta·tion (ăn′ō-tā′shən) *n.* 1. The act or process of annotating. 2. A critical or explanatory note : COMMENTARY.

an·nounce (ə-nouns′) *vt.* **-nounced, -nounc·ing, -nounc·es.** [ME *announcen* < OFr. *anoncier* < Lat. *annuntiare* : *ad-*, to + *nuntiare*, to report < *nuntius*, messenger.] 1. To bring to public notice officially or formally <*announce* a marriage> 2. To proclaim the presence or arrival of <*announce* a guest> 3. To make aware or conscious of through the senses <Smells of cooking *announced* dinner.> 4. To serve as an announcer.

an·nounce·ment (ə-nouns′mənt) *n.* 1. The act of announcing. 2. Something that is announced. 3. A public statement or notice.

an·nounc·er (ə-noun′sər) *n.* 1. One that announces. 2. A radio or television performer who provides program continuity and delivers commercial announcements.

an·noy (ə-noi′) *v.* **-noyed, -noy·ing, -noys.** [ME *anoien* < OFr. *anoier* < LLat. *inodiare*, to make odious < Lat. *in odio*, odious : *in*, in + *odium*, hatred.] —*vt.* 1. To bother or irritate. 2. To disturb by repeated attacks : HARASS. —*vi.* To behave in an annoying way.

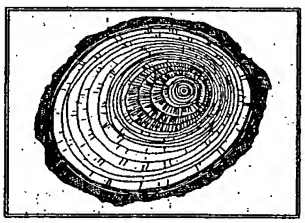
★ ***syns:*** ANNOY, AGGRAVATE, BOTHER, BUG, CHAFE, DISTURB, EXASPERATE, FRET, GALL, GET, IRE, IRRITATE, NETTLE, PEEVE, PROVOKE, RUFFLE, VEX *v. core meaning* : to trouble (another) by repeated vexations <Their constant bickering *annoys* me.>

an·noy·ance (ə-noi′əns) *n.* 1. Something that annoys : NUISANCE. 2. The act of annoying. 3. Irritation : vexation.

an·noy·ing (ə-noi′ĭng) *adj.* Causing annoyance : BOTHERSOME <an *annoying* tickle in my throat> —**an·noy′ing·ly** *adv.*

an·nu·al (ăn′yōō-əl) *adj.* [ME *annuel* < OFr. < LLat. *annualis* < Lat. *annus*, year.] 1. Recurring, done, or performed every year : YEARLY <an *annual* checkup> 2. Determined by a year's time <*annual* precipitation> 3. *Bot.* Living and growing for only one year or season. —*n.* 1. A periodical published yearly. 2. A plant whose life cycle is completed in one year or season. —**an′nu·al·ly** *adv.*

annual ring *n.* One of the concentric layers of wood, esp. in a tree trunk, indicating a year's growth in temperate climates and seasonal growth in regions of wet and dry seasons.



annual ring
Off-center annual rings with faster growth at left

an·nu·i·tant (ə-nōō′ĭ-tənt, ə-nyōō′-) *n.* One who is entitled to receive an annuity.

an·nu·i·ty (ə-nōō′ĭ-tē, -nyōō′-) *n., pl.* **-ties.** [ME *annuite* < ANFr. < Med. Lat. *annuitas* < Lat. *annuus*, yearly < *annus*, year.] 1. a. The annual payment of an allowance or income. b. The right to receive or the obligation to make this payment. 2. An investment on which a person receives fixed payments for a lifetime or a specified number of years.

an·nul (ə-nŭl′) *vt.* **-nulled, -nul·ling, -nuls.** [ME *annullen* < OFr. *annuller* < LLat. *annullare* : Lat. *ad-*, to + Lat. *nullus*, none.] 1. To make or declare void or invalid, as a marriage or a law : NULLIFY. 2. To obliterate the existence or effect of.

an·nu·lar (ăn′yə-lər) *adj.* [OFr. *annulaire* < Lat. *anularis* <*anulus*, ring.] Shaped like or forming a ring.

annular eclipse *n.* A solar eclipse in which the moon covers all but a bright ring around the circumference of the sun.

annular ligament *n.* A ligament or fibrous band that rings the ankle or wrist joint.

an·nu·late (ăn′yə-lĭt, -lāt′) *also* **an·nu·lat·ed** (-lā′tĭd) *adj.* [Lat. *anulatus* < *anulus*, ring.] Having, made up of, or formed by rings or ringlike segments.

an·nu·la·tion (ăn′yə-lā′shən) *n.* 1. The act or process of forming rings. 2. A ringlike segment or structure.

an·nu·let (ăn′yə-lĭt) *n.* [Lat. *anulus*, ring + -ET.] A ringlike molding around the capital of a pillar.

an·nu·li (ăn′yə-lī′) *n. var. pl. of* ANNULUS.

an·nul·ment (ə-nŭl′mənt) *n.* 1. The act of annulling. 2. The retrospective and prospective invalidation of a marriage, as for nonconsummation, effected by means of a declaration stating that the marriage was never valid.

an·nu·lus (ăn′yə-ləs) *n., pl.* **-lus·es** *or* **-li** (-lī′) [Lat. *anulus*, ring.] 1. A ringlike figure, part, structure, or marking. 2. *Math.* The figure bounded by and containing the area between two concentric circles.

an·nun·ci·ate (ə-nŭn′sē-āt′) *vt.* **-at·ed, -at·ing, -ates.** [Lat. *annuntiare.* —see ANNOUNCE.] To announce or proclaim, esp. formally or officially.

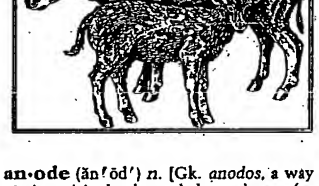
an·nun·ci·a·tion (ə-nŭn′sē-ā′shən) *n.* 1. The act of announcing. 2. An announcement. 3. **Annunciation.** a. The angel Gabriel's announcement of the Incarnation. b. The festival, on Mar. 25, celebrating of this event.

Annunciation lily *n.* The Madonna lily.

an·nun·ci·a·tor (ə-nŭn′sē-ā′tər) *n.* 1. One that announces. 2. An electrical signaling device used in hotels or offices to indicate the source of calls on a switchboard.

an·nus mi·rab·i·lis (ăn′əs mĭ-răb′ə-lĭs) *n.* [NLat., wondrous year.] An extraordinary year <"Hungary's blood bath was the saddest event in that *annus mirabilis*" —C.L. Sulzberger>

a·no·a (ə-nō′ə) *n.* [Native word in Celebes.] A buffalo, *Anoa depressicornis* of Celebes and the Philippines, with short, pointed horns.



anoa
6–7 feet long

an·ode (ăn′ōd′) *n.* [Gk. *anodos*, a way up : *ana-*, up + *hodos*, way.] 1. A positively charged electrode, as of an electrolytic cell, storage battery, or electron tube. 2. The negatively charged terminal of a primary cell or of a storage battery that is supplying current.

anode mud *n.* The residue of electrolytic refining, esp. of copper, high in concentrations of inert metals such as platinum or gold.

an·o·dize (ăn′ə-dīz′) *vt.* **-dized, -diz·ing, -diz·es.** [ANOD(E) + -IZE.] To coat (a metallic surface) electrolytically with a protective oxide. —**an′o·di·za′tion** *n.*

an·o·dyne (ăn′ə-dīn′) *adj.* [Lat. *anodynus* < Gk. *anōdunos*, free from pain : *an-*, without + *odunē*, pain.] 1. Capable of relieving pain. 2. Serving to soothe or relax <*anodyne* hobbies> 3. Watered-down : insipid. —*n.* 1. A medicine that relieves pain. 2. A soothing or comforting agent.

a·noint (ə-noint′) *vt.* **a·noint·ed, a·noint·ing, a·noints.** [ME *enointen* < OFr. *enoindre* < Lat. *inunguere* : *in-*, on + *ungere*, to smear.] 1. To apply oil or ointment to. 2. To place oil on as an indication of sanctification or consecration in a religious ceremony.

anointing of the sick *n. Rom. Cath. Ch.* The sacrament of

April 29, 1969 P. S. VAN BAARN 3,441,161

BOTTLE CAP

Filed March 9, 1967 Sheet 1 of 3

Fig. 1.

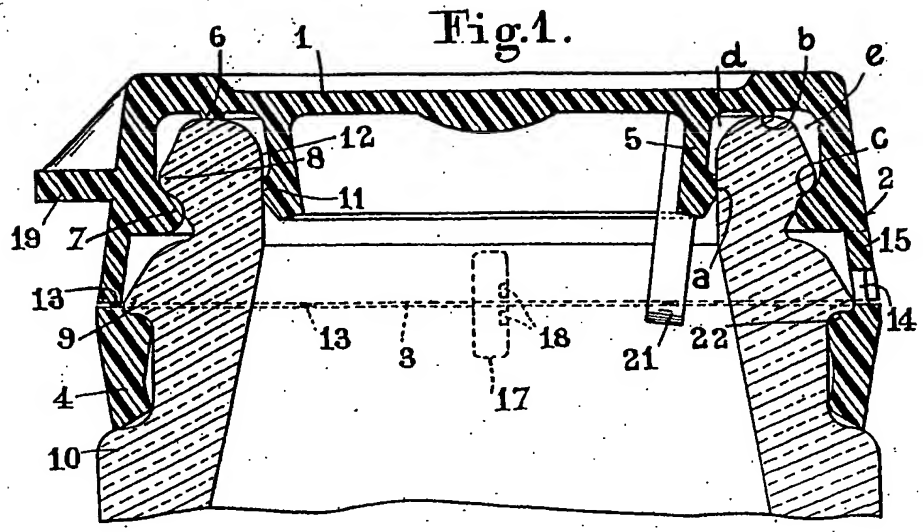
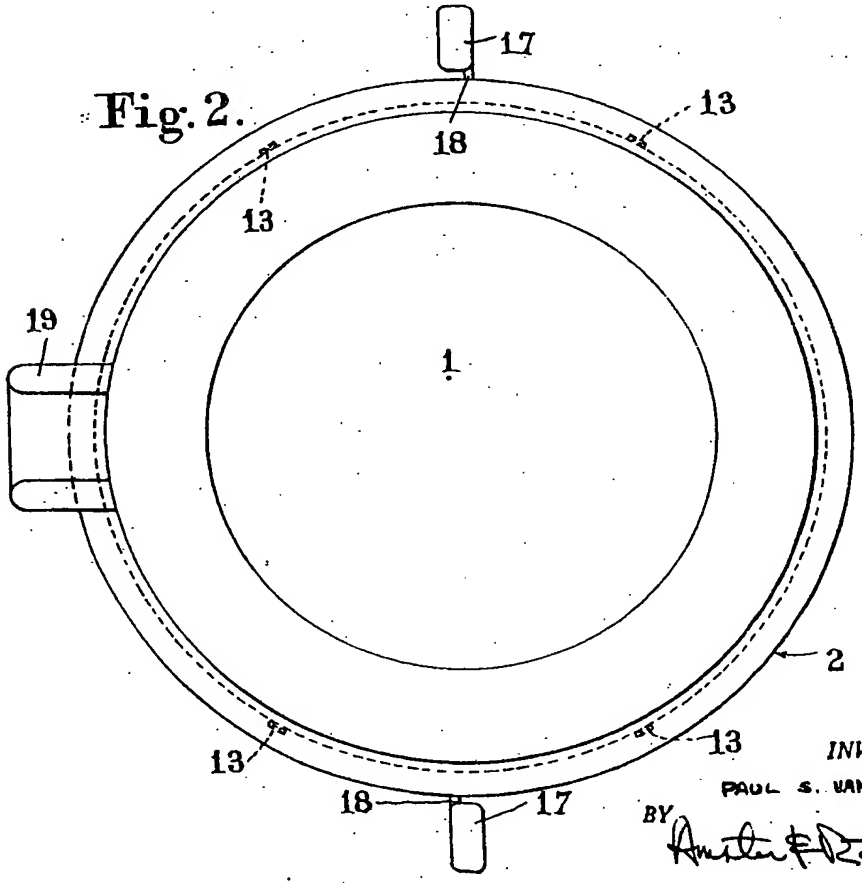


Fig. 2.



INVENTOR.
PAUL S. VAN BAARN
BY

April 29, 1969 P. S. VAN BAARN 3,441,161

BOTTLE CAP

Filed March 9, 1967 Sheet 2 of 3

Fig. 3.

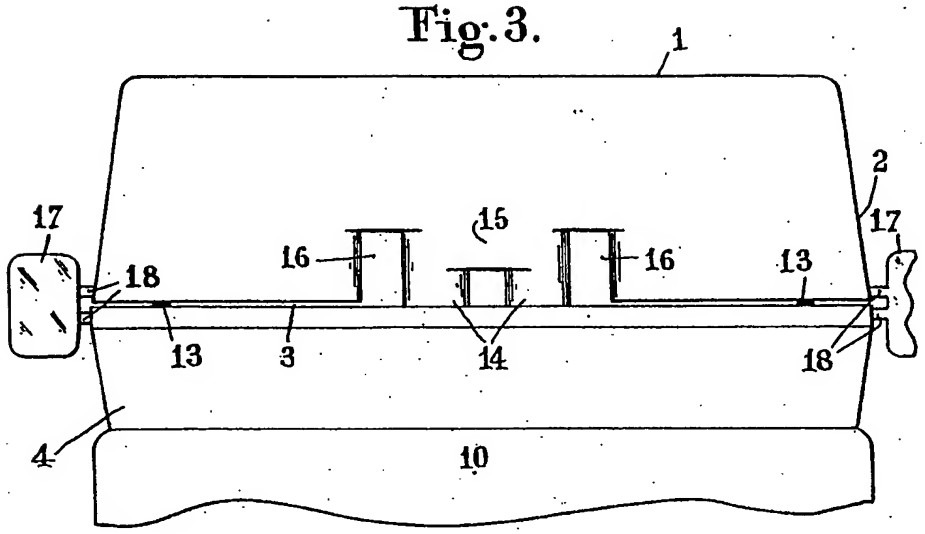


Fig. 4.

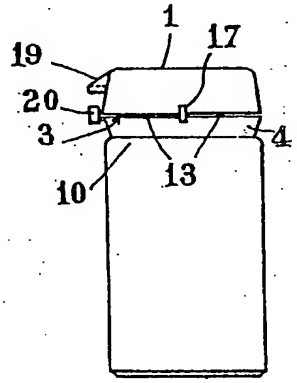
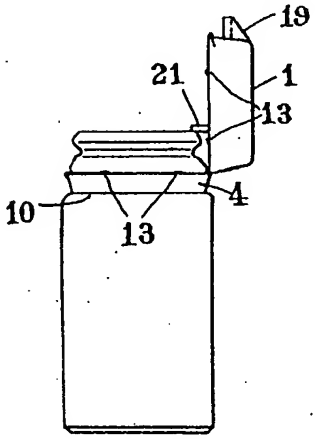


Fig. 5.



INVENTOR.
PAUL S. VAN BAARN
BY Amster & Rothstein

April 29, 1969 P. S. VAN BAARN 3,441,161

BOTTLE CAP

Filed March 9, 1967 Sheet 3 of 3

Fig. 6

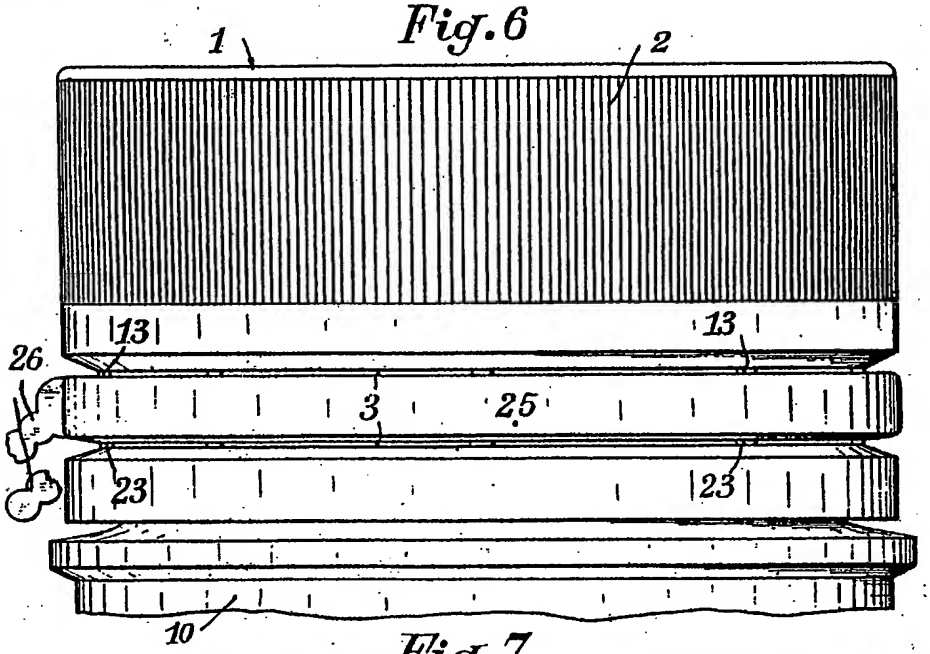


Fig. 7